

An ion implantation system for producing silicon wafers having relatively low defect densities, e.g., below about $1 \times 10^6/\text{cm}^2$, includes a fluid port in the ion implantation chamber for introducing a background gas into the chamber during the ion implantation process. The introduced gas, such as water vapor, reduces the defect density of the top silicon layer that is separated from the buried silicon dioxide layer.

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